

WHAT IS CLAIMED IS:

1           1. A method of controlling a motor vehicle with an  
2     automated clutch, with an engine that is actuated by an engine  
3     control device, with an actuator-controlled automated  
4     transmission, and with at least one electronic control device  
5     for actuating the transmission and the clutch, the method  
6     including the steps of:

- 7     - detecting a quantity that is at least representative of a  
8     traveling speed of the vehicle,  
9     - detecting an actuation of at least one of a brake and a  
10    fuel-metering element,  
11    - detecting an operating state of the engine,  
12    - taking the clutch out of engagement if the engine is found  
13    to be running while the vehicle is found to be traveling at  
14    a speed greater than a threshold value, and if at the same  
15    time neither the brake pedal nor the fuel-metering element  
16    is found to be actuated, and  
17    - subsequently re-engaging the clutch if at least one of the  
18    brake pedal and the fuel-metering element is found to be  
19    actuated,

20    wherein prior to said re-engaging of the clutch, a  
21    transmission input rpm-rate is determined, and an engine rpm-

22 rate is controlled in such a manner that said engine rpm-rate  
23 and said transmission input rpm-rate are brought towards a  
24 closer agreement.

1           2. The method of claim 1, wherein the engine rpm-rate  
2    is brought into closer agreement with the transmission input  
3    rpm-rate by setting an rpm-target for the engine control  
4    device.

1           3. The method of claim 2, wherein the rpm-target for  
2     the engine control device is set by the electronic control  
3     device, and wherein the engine control device brings the  
4     engine rpm-rate into closer agreement with the rpm-target by  
5     controlling a fuel flow rate to the engine.

1           4. The method of claim 1, wherein the engine rpm-rate  
2   is brought into closer agreement with the transmission input  
3   rpm-rate through a control intervention directed at an output  
4   torque of the engine.

1           5. The method of claim 4, wherein said control  
2   intervention is effected through the steps that:  
3   - the at least one electronic control device sets an engine

4 torque control target for the engine control device,  
5 - the engine control device adjusts the engine torque  
6 according to said control target, and  
7 - the control target is varied over time during said  
8 adjustment in such a manner that the engine rpm-rate is  
9 brought into agreement with the transmission input rpm-  
10 rate.

1 6. The method of claim 1, wherein the re-engaging of  
2 the clutch takes place after the engine rpm-rate and the  
3 transmission input rpm-rate are in agreement.

1 7. The method of claim 1, wherein the re-engaging of  
2 the clutch is started after the engine rpm-rate and the  
3 transmission input rpm-rate are in agreement.

1 8. The method of claim 6, wherein the re-engaging of  
2 the clutch is performed at a maximum speed of engagement.

1 9. The method of claim 6, wherein said agreement is  
2 considered to be met if the engine rpm-rate and the  
3 transmission input rpm-rate are within 5% of each other.

1           10. The method of claim 6, wherein said agreement is  
2       considered to be met if the engine rpm-rate and the  
3       transmission input rpm-rate are within 50 rpm of each other.

1           11. The method of claim 6, wherein a criterion for  
2       considering said agreement to be met depends on a rate of  
3       change of the engine rpm-rate.

1           12. The method of claim 6, wherein said agreement is  
2       considered to be met if the engine rpm-rate equals or exceeds  
3       the transmission input rpm-rate.

1           13. The method of claim 4, wherein after the re-  
2       engaging of the clutch an indicated level of engine torque at  
3       which the control intervention was performed is cut back by  
4       lowering a fuel flow rate to the engine.

1           14. The method of claim 1, wherein if the actuation  
2       of the brake is detected, the re-engaging of the clutch takes  
3       place before the engine rpm-rate and the transmission input  
4       rpm-rate are in agreement.

1           15. The method of claim 1, wherein if the actuation

of the fuel-metering device is detected, the re-engaging of the clutch takes place when or after the engine rpm-rate and the transmission input rpm-rate are in agreement

16. A method of controlling a motor vehicle with an automated clutch, with an engine that is actuated by an engine control device, with an actuator-controlled automated transmission, and with at least one electronic control device for actuating the transmission and the clutch, the method including the steps of:

- detecting a quantity that is at least representative of a traveling speed of the vehicle,
- detecting an actuation of at least one of a brake and a fuel-metering element,
- detecting an operating state of the engine,
- taking the clutch out of engagement if the engine is found to be running while the vehicle is found to be traveling at a speed greater than a threshold value, and if at the same time neither the brake pedal nor the fuel-metering element is found to be actuated, and
- immediately beginning to re-engage the clutch if the brake pedal is found to be actuated.

17. A method of controlling a motor vehicle with an automated clutch, with an engine that is actuated by an engine control device, with an actuator-controlled automated transmission, and with at least one electronic control device for actuating the transmission and the clutch, the method including the steps of:

- detecting a quantity that is at least representative of a traveling speed of the vehicle,
- detecting an actuation of at least one of a brake and a fuel-metering element,
- detecting an operating state of the engine,
- taking the clutch out of engagement if the engine is found to be running while the vehicle is found to be traveling at a speed greater than a threshold value, and if at the same time neither the brake pedal nor the fuel-metering element is found to be actuated, and
- while the clutch is disengaged, setting the transmission into a neutral position.

18. The method of claim 17, wherein after the transmission has been set into the neutral position, a volume-equalizing process is allowed to take place in a hydraulic circuit of the motor vehicle.

1           19. The method of claim 18, wherein the clutch  
2 remains engaged for a selectable time period while said  
3 volume-equalizing process is taking place.

1           20. The process of claim 17, wherein a current  
2 transmission ratio that is engaged prior to setting the  
3 transmission into the neutral position is stored in a memory  
4 of the electronic control unit.

1           21. The method of claim 20, wherein while the clutch  
2 is disengaged and the transmission is in the neutral position,  
3 the stored transmission ratio is re-engaged.

1           22. The method of claim 18, wherein the clutch is re-  
2 engaged after the transmission has been set into the neutral  
3 position and wherein the volume-equalizing process is  
4 performed only after a selectable time period has elapsed  
5 following said re-engagement of the clutch.

1           23. The method of claim 20, wherein if the motor  
2 speeds up after the clutch has been disengaged and the  
3 transmission has been set into the neutral position, a higher

4 transmission ratio than has been stored in memory is set in  
5 the transmission.

1 24. A method of controlling a motor vehicle with an  
2 automated clutch, with an engine that is actuated by an engine  
3 control device, with an actuator-controlled automated  
4 transmission, and with at least one electronic control device  
5 for actuating the transmission and the clutch, the method  
6 including the steps of:

7 a) detecting a quantity that is at least representative of a  
8 traveling speed of the vehicle,

9 b) detecting an actuation of at least one of a brake and a  
10 fuel-metering element,

11 c) detecting an operating state of the engine,

12 d) detecting whether a current traveling situation indicates  
13 a need for engine-braking, and

14 e) if the engine is found to be running while the vehicle is  
15 found to be traveling at a speed greater than a threshold  
16 value, and if at the same time neither the brake pedal nor  
17 the fuel-metering element is found to be actuated:

18 - disengaging the clutch if the result of step d) is  
19 negative,

20 - preventing disengagement of the clutch if the

21                   result of step d) is affirmative.

1                   25. The method of claim 24, wherein the need for  
2 engine-braking is found by detecting that the motor vehicle is  
3 traveling on a downhill grade.

1                   26. The method of claim 24, wherein the need for  
2 engine-braking is found by detecting that the non-actuated  
3 state of the fuel-metering device was preceded by a rapid  
4 cutback of the fuel-metering device.

1                   27. The method of claim 26, wherein said rapid  
2 cutback occurs within a time interval of less than 0.2  
3 seconds.

1                   28. The method of claim 24, wherein the need for  
2 engine-braking is found by detecting that the motor vehicle is  
3 being driven in a sport-oriented manner.

1                   29. The method of claim 24, wherein the need for  
2 engine-braking is found by detecting that a sport-oriented  
3 program mode has been selected in a mode-selector device.